

## ΚΛΕΙΣΤΟ ΓΗΠΕΔΟ ΚΑΜΠΟΧΩΡΩΝ

## Preface

Notes on planning:

The energy consumption quantities do not take into account light scenes and their dimming levels.

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### Building 1

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Site 1 - Building 1

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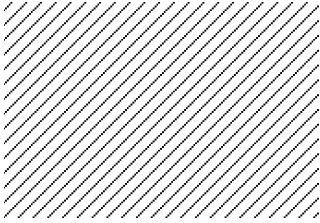
Site 1 - Building 1 - Storey 1

### Room 1

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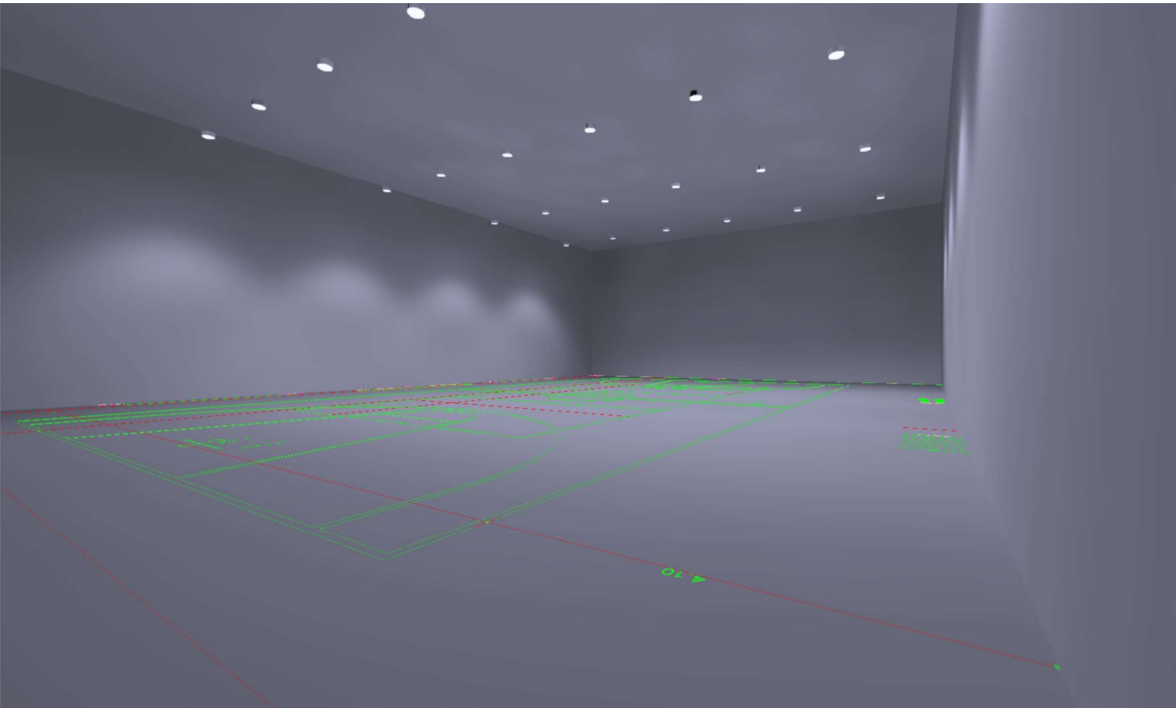
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## Contacts



ΠΑΡΘΕΝΙΔΗΣ ΚΩΝ/ΝΟΣ

Τ.Υ.Δ.ΧΙΟΥ



## Description

Επισκευαστικές εργασίες σε κλειστά γυμναστήρια του Δήμου Χίου

ΠΑΡΘΕΝΙΔΗΣ ΚΩΝ/ΝΟΣ

Τ.Υ.Δ.ΧΙΟΥ

## Luminaire list

$\Phi_{total}$ 550564 lm	$P_{total}$ 3360.0 W	Luminous efficacy 163.9 lm/W
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pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
28	Disano Illuminazione S.p.A	330749-00	2883 Saturno $\varnothing$ 370 UGR<lt>25 - wide beam 4000K CRI 80 120W CLD Graphite	120.0 W	19663 lm	163.9 lm/W

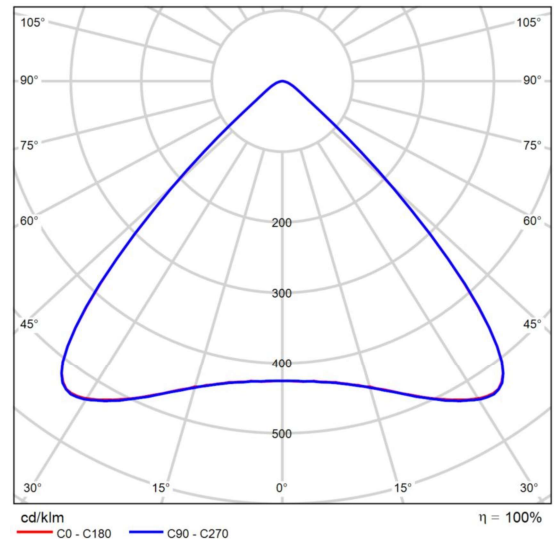
Product data sheet

Disano Illuminazione S.p.A - 2883 Saturno ø370 UGR<lt>25 - wide beam 4000K CRI 80 120W CLD Graphite



Article No.	330749-00
P	120.0 W
Φ <sub>Lamp</sub>	19664 lm
Φ <sub>Luminaire</sub>	19663 lm
η	99.99 %
Luminous efficacy	163.9 lm/W
CCT	4000 K
CRI	80

Housing: in die-cast aluminium with cooling fins integrated in the cover. Optics: in high-performance PMMA resistant to high temperatures and UV rays. Diffuser: tempered glass, 4 mm thick, resistant to thermal shock and impact (UNI EN 12150-1:2001). : UGR<lt>25 Coating: the fully automated powder-coating cycle involves a polyester-based, salt-spray corrosion-resistant and UV-stabilised paint. Special coating: Upon request: protective coating recommended for marine environments within 5 km (3 miles) of the sea. Heat Sink: the heat sink is designed and made to allow the LEDs to operate at temperatures capable of ensuring excellent performance/output and long service life. Low flicker: luminaire with very low flicker: evenly distributed light for greater visual safety. Photobiological risk: exempt risk group according to EN62471. : EN60598-1. They have a degree of protection according to the EN60529 standard. Equipment: - waterproof connector for quick installation with no need to open the fixture - temperature controller with auto-reset - EN 61547 compliant surge protection. - anti-condensation valve Easy installation: -The fixture can be suspended from two attachment points by means of threaded bar (L = 200 mm) and hook to be purchased separately. On request: -Class II fixtures, protection up to 10KV. -Built-in presence/light sensor with ON-OFF function, dimmable (0-10V, 1-10V or DALI) or



Polar LDC

Glare evaluation according to UGR											
p Ceiling		70	70	50	50	30	70	70	50	50	30
p Walls		50	30	50	30	30	50	30	50	30	30
p Floor		20	20	20	20	20	20	20	20	20	20
Room size	Viewing direction at right angles to lamp axis	Viewing direction parallel to lamp axis									
X Y											
2H	2H	24.2	25.2	24.4	25.4	25.6	24.2	25.2	24.4	25.4	25.6
	3H	24.1	25.0	24.4	25.2	25.5	24.1	25.0	24.4	25.2	25.5
	4H	24.1	24.9	24.4	25.2	25.4	24.1	24.9	24.4	25.2	25.4
	6H	24.0	24.8	24.3	25.1	25.4	24.0	24.8	24.3	25.1	25.4
	8H	24.0	24.7	24.3	25.0	25.3	24.0	24.7	24.3	25.0	25.3
	12H	23.9	24.6	24.3	25.0	25.3	23.9	24.6	24.3	25.0	25.3
4H	2H	24.0	24.8	24.3	25.1	25.4	24.0	24.8	24.3	25.1	25.4
	3H	24.0	24.7	24.3	25.0	25.3	24.0	24.7	24.3	25.0	25.3
	4H	23.9	24.6	24.3	24.9	25.3	23.9	24.6	24.3	24.9	25.3
	6H	23.9	24.4	24.3	24.8	25.2	23.9	24.4	24.3	24.8	25.2
	8H	23.9	24.4	24.3	24.7	25.2	23.9	24.4	24.3	24.8	25.2
	12H	23.8	24.3	24.3	24.7	25.1	23.8	24.3	24.3	24.7	25.1
8H	4H	23.8	24.4	24.3	24.7	25.1	23.9	24.4	24.3	24.7	25.2
	6H	23.8	24.2	24.3	24.6	25.1	23.8	24.2	24.3	24.6	25.1
	8H	23.8	24.1	24.2	24.6	25.1	23.8	24.1	24.3	24.6	25.1
	12H	23.7	24.1	24.2	24.5	25.0	23.7	24.1	24.2	24.5	25.0
12H	4H	23.8	24.3	24.2	24.7	25.1	23.8	24.3	24.3	24.7	25.1
	6H	23.8	24.1	24.2	24.6	25.0	23.8	24.1	24.2	24.6	25.1
	8H	23.7	24.0	24.2	24.5	25.0	23.7	24.1	24.2	24.5	25.0
Variation of the observer position for the luminaire distances S											
S = 1.0H		+2.4 / -6.3					+2.4 / -6.2				
S = 1.5H		+4.6 / -7.5					+4.6 / -7.5				
S = 2.0H		+6.6 / -8.3					+6.5 / -8.3				
Standard table		BK00					BK00				
Correction summand		5.7					5.7				
Corrected glare indices referring to 19864lm Total luminous flux											

UGR diagram (SHR: 0.25)

## Product data sheet

Disano Illuminazione S.p.A - 2883 Saturno ø370 UGR<math></math>25 - wide beam 4000K CRI 80 120W CLD Graphite

for ZHAGA socket. -Centralized lighting point control or via external presence/lighting sensors. -CLD D-D (DALI) wiring with subcode -0041. -Emergency wiring with centralized power supply CLD EC (subcode -0050). -AMBER LED 2200K with subcode -73.

Building 1

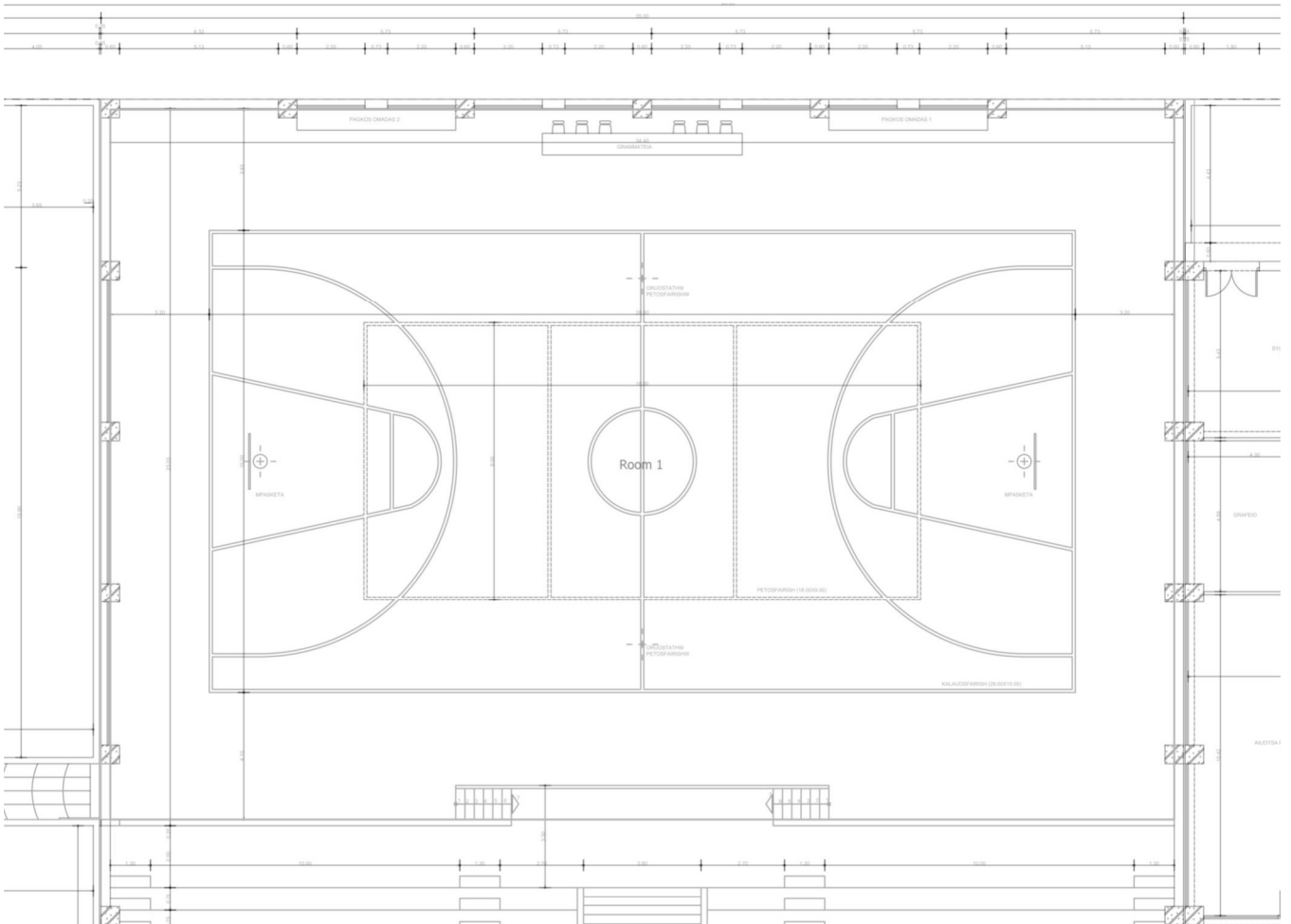
**Luminaire list**

$\Phi_{total}$ 550564 lm	$P_{total}$ 3360.0 W	Luminous efficacy 163.9 lm/W
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pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
28	Disano Illuminazione S.p.A	330749-00	2883 Saturno $\varnothing$ 370 UGR<math><25</math> - wide beam 4000K CRI 80 120W CLD Graphite	120.0 W	19663 lm	163.9 lm/W

Building 1 · Storey 1 (Light scene 1)

Room list



Building 1 · Storey 1 (Light scene 1)

## Room list

Room 1

<b>P<sub>total</sub></b> 2880.0 W	<b>A<sub>Room</sub></b> 791.20 m <sup>2</sup>	<b>Lighting power density</b> 3.64 W/m <sup>2</sup> = 0.69 W/m <sup>2</sup> /100 lx (Space) 3.92 W/m <sup>2</sup> = 0.75 W/m <sup>2</sup> /100 lx (Working plane)	<b>E<sub>perpendicular (Working plane)</sub></b> 524 lx
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pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
24	Disano Illuminazione S.p.A	330749-00	2883 Saturno ø370 UGR<lt/>25 - wide beam 4000K CRI 80 120W CLD Graphite	120.0 W	19663 lm

Building 1 · Storey 1

**Luminaire list** $\Phi_{total}$ 

550564 lm

 $P_{total}$ 

3360.0 W

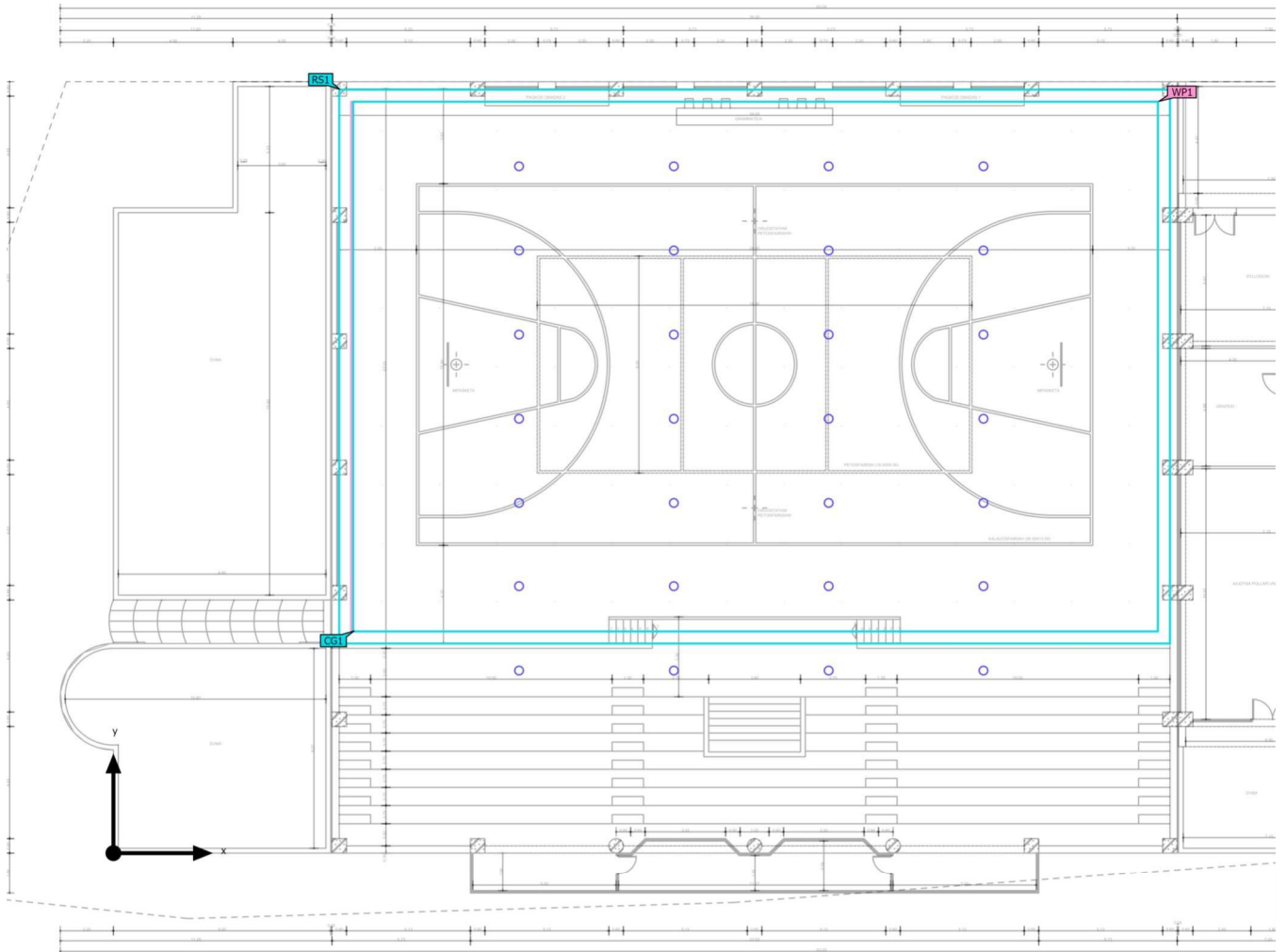
Luminous efficacy

163.9 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
28	Disano Illuminazione S.p.A	330749-00	2883 Saturno $\varnothing$ 370 UGR<math><25</math> - wide beam 4000K CRI 80 120W CLD Graphite	120.0 W	19663 lm	163.9 lm/W

Building 1 · Storey 1 (Light scene 1)

**Calculation objects**



Building 1 · Storey 1 (Light scene 1)

**Calculation objects**

## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Room 1) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.500 m	524 lx ( $\geq 500$ lx) ✓	92.3 lx	762 lx	0.18 ( $\geq 0.60$ ) ✗	0.12	WP1

## Surface result objects

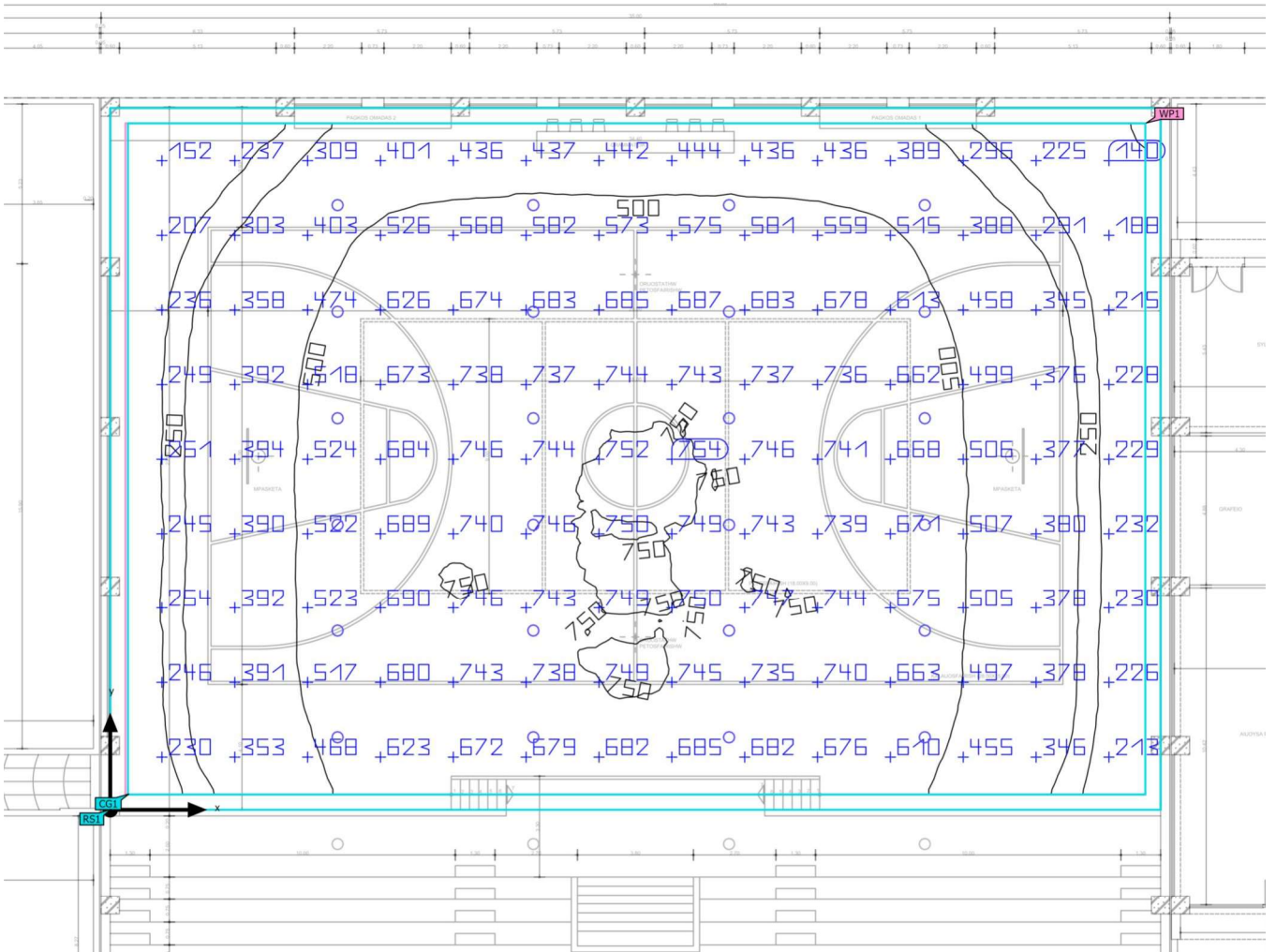
Properties	$\varnothing$	min	max	$U_o (g_1)$	$g_2$	Index
Surface result object 1 (Floor/ceiling) Perpendicular illuminance (adaptive) Height: 0.000 m	497 lx	86.8 lx	767 lx	0.17	0.11	RS1
Surface result object 1 (Floor/ceiling) Luminance Height: 0.000 m	31.6 cd/m <sup>2</sup>	5.53 cd/m <sup>2</sup>	48.8 cd/m <sup>2</sup>	0.18	0.11	RS1

## Calculation surfaces

Properties	$\bar{E}$	$E_{min}$	$E_{max}$	$U_o (g_1)$	$g_2$	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	516 lx	151 lx	765 lx	0.29	0.20	CG1

Building 1 · Storey 1 · Room 1 (Light scene 1)

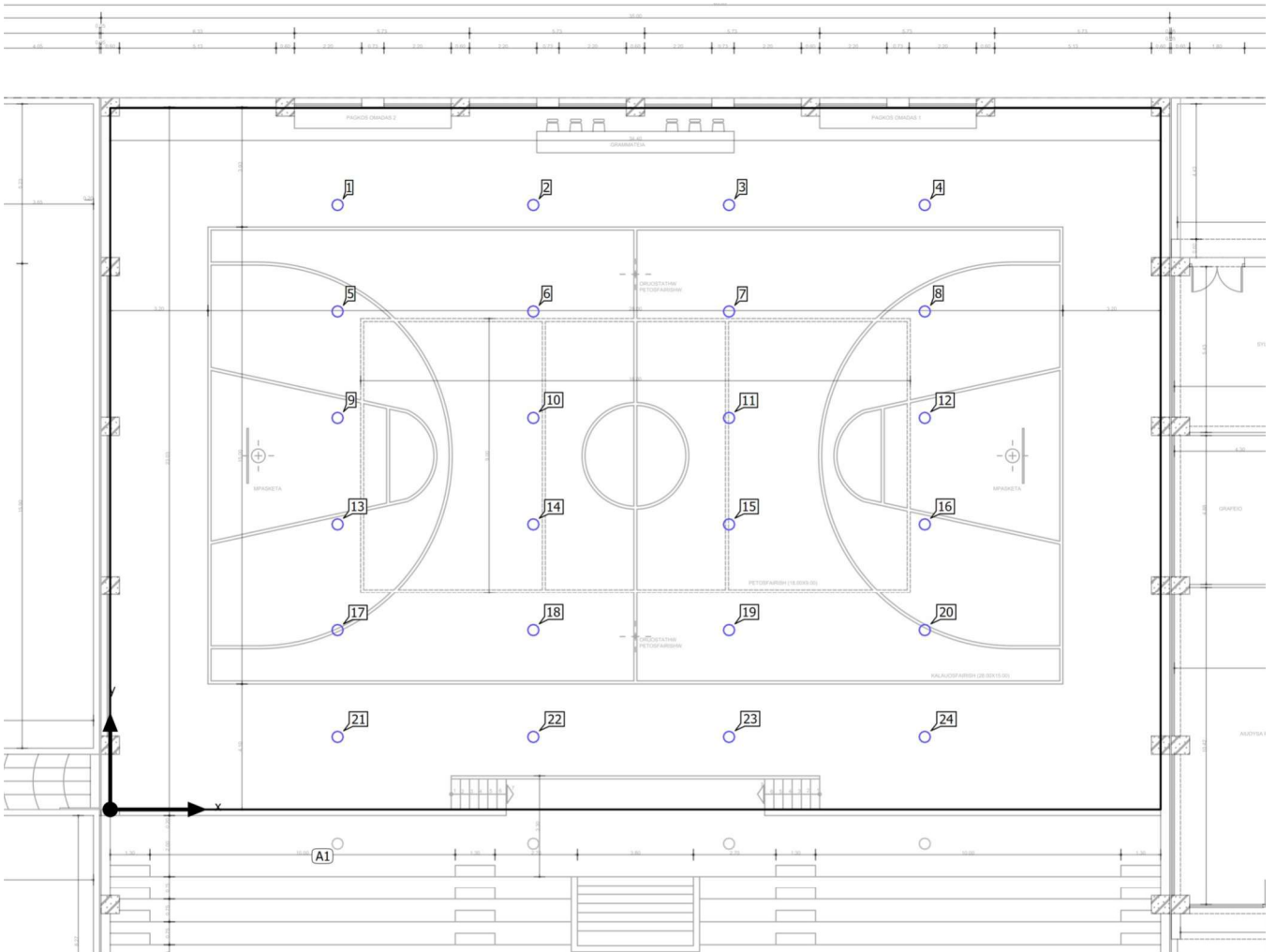
### Summary



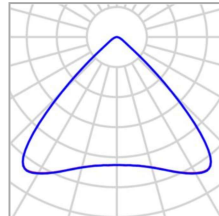
Ground area	791.20 m <sup>2</sup>	Clearance height	10.000 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	8.800 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.500 m



Building 1 · Storey 1 · Room 1  
**Luminaire layout plan**



Building 1 · Storey 1 · Room 1  
**Luminaire layout plan**



Manufacturer	Disano Illuminazione S.p.A	P	120.0 W
Article No.	330749-00	Φ <sub>Luminaire</sub>	19663 lm
Article name	2883 Saturno ø370 UGR<lt/>25 - wide beam 4000K CRI 80 120W CLD Graphite		
Fitting	1x led_2883_120		

28 x Disano Illuminazione S.p.A 2883 Saturno ø370 UGR<lt/>25 - wide beam 4000K CRI 80 120W CLD Graphite

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	7.446 m / 2.372 m / 8.800 m	7.446 m	19.822 m	8.800 m	1
X-direction	4 pcs., Centre - centre, 6.410 m	13.856 m	19.822 m	8.800 m	2
		20.267 m	19.822 m	8.800 m	3
Y-direction	7 pcs., Centre - centre, 3.490 m	26.677 m	19.822 m	8.800 m	4
		7.446 m	16.332 m	8.800 m	5
Arrangement	A1	13.856 m	16.332 m	8.800 m	6
		20.267 m	16.332 m	8.800 m	7
		26.677 m	16.332 m	8.800 m	8
		7.446 m	12.842 m	8.800 m	9
		13.856 m	12.842 m	8.800 m	10
		20.267 m	12.842 m	8.800 m	11
		26.677 m	12.842 m	8.800 m	12

Building 1 · Storey 1 · Room 1  
**Luminaire layout plan**

X	Y	Mounting height	Luminaire
7.446 m	9.352 m	8.800 m	13
13.856 m	9.352 m	8.800 m	14
20.267 m	9.352 m	8.800 m	15
26.677 m	9.352 m	8.800 m	16
7.446 m	5.862 m	8.800 m	17
13.856 m	5.862 m	8.800 m	18
20.267 m	5.862 m	8.800 m	19
26.677 m	5.862 m	8.800 m	20
7.446 m	2.372 m	8.800 m	21
13.856 m	2.372 m	8.800 m	22
20.267 m	2.372 m	8.800 m	23
26.677 m	2.372 m	8.800 m	24

Building 1 · Storey 1 · Room 1

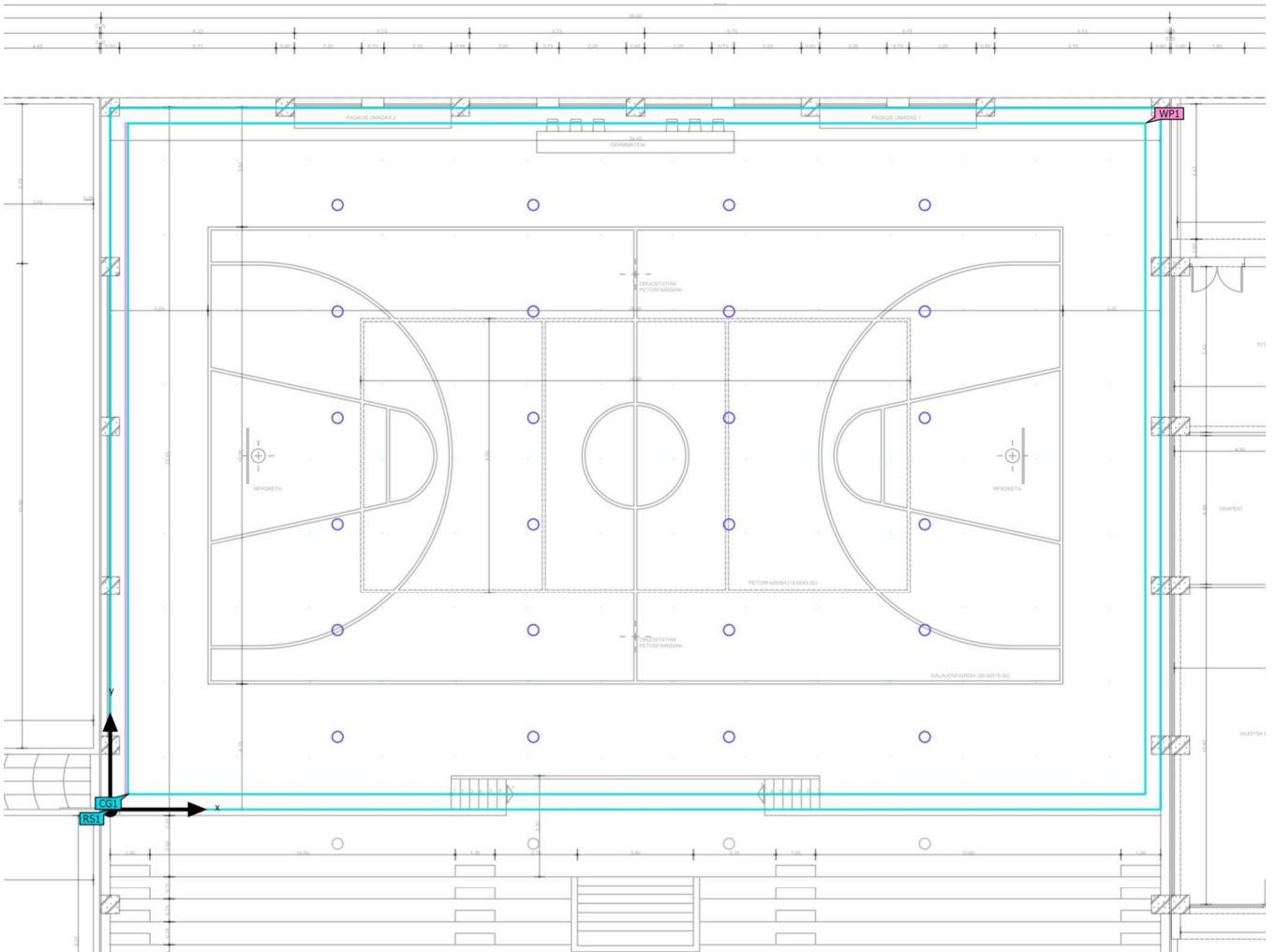
**Luminaire list**

$\Phi_{total}$ 471912 lm	$P_{total}$ 2880.0 W	Luminous efficacy 163.9 lm/W
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pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
24	Disano Illuminazione S.p.A	330749-00	2883 Saturno $\varnothing$ 370 UGR<math><25 - wide beam 4000K</math> CRI 80 120W CLD Graphite	120.0 W	19663 lm	163.9 lm/W

Building 1 · Storey 1 · Room 1 (Light scene 1)

### Calculation objects



Building 1 · Storey 1 · Room 1 (Light scene 1)

**Calculation objects**

## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Room 1) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.500 m	524 lx ( $\geq 500$ lx) ✓	92.3 lx	762 lx	0.18 ( $\geq 0.60$ ) ✗	0.12	WP1

## Surface result objects

Properties	$\varnothing$	min	max	$U_o (g_1)$	$g_2$	Index
Surface result object 1 (Floor/ceiling) Perpendicular illuminance (adaptive) Height: 0.000 m	497 lx	86.8 lx	767 lx	0.17	0.11	RS1
Surface result object 1 (Floor/ceiling) Luminance Height: 0.000 m	31.6 cd/m <sup>2</sup>	5.53 cd/m <sup>2</sup>	48.8 cd/m <sup>2</sup>	0.18	0.11	RS1

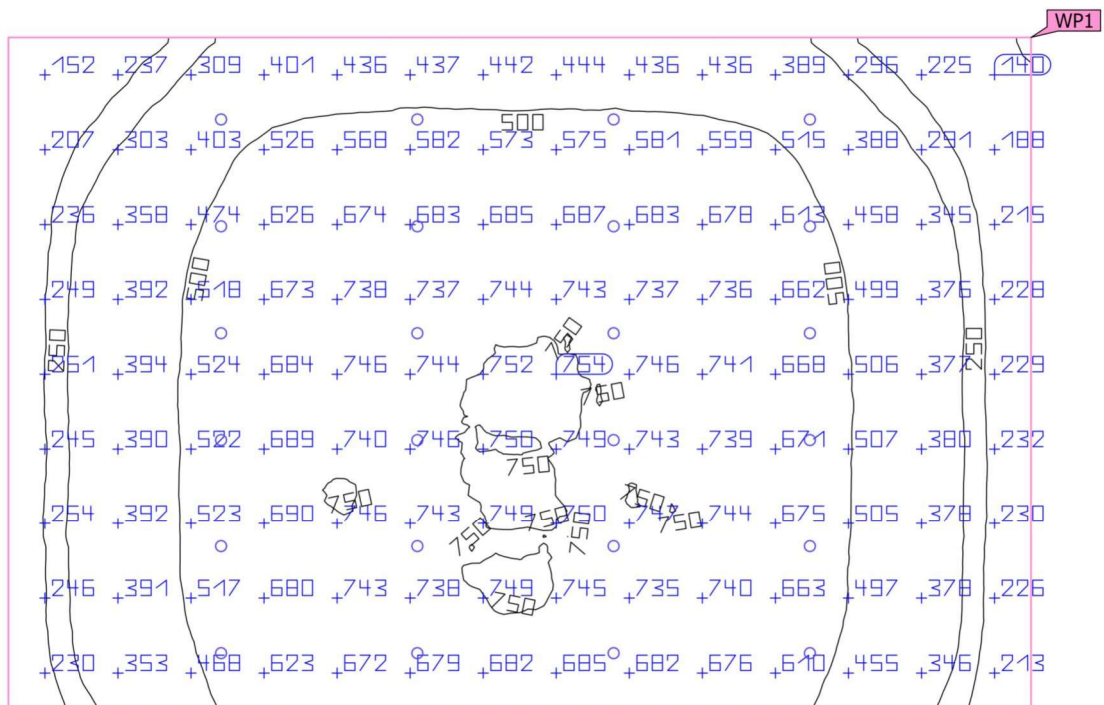
## Calculation surfaces

Properties	$\bar{E}$	$E_{min}$	$E_{max}$	$U_o (g_1)$	$g_2$	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	516 lx	151 lx	765 lx	0.29	0.20	CG1

Utilisation profile: DIALux presetting (34.2 Standard (office))

Building 1 · Storey 1 · Room 1 (Light scene 1)

**Working plane (Room 1)**

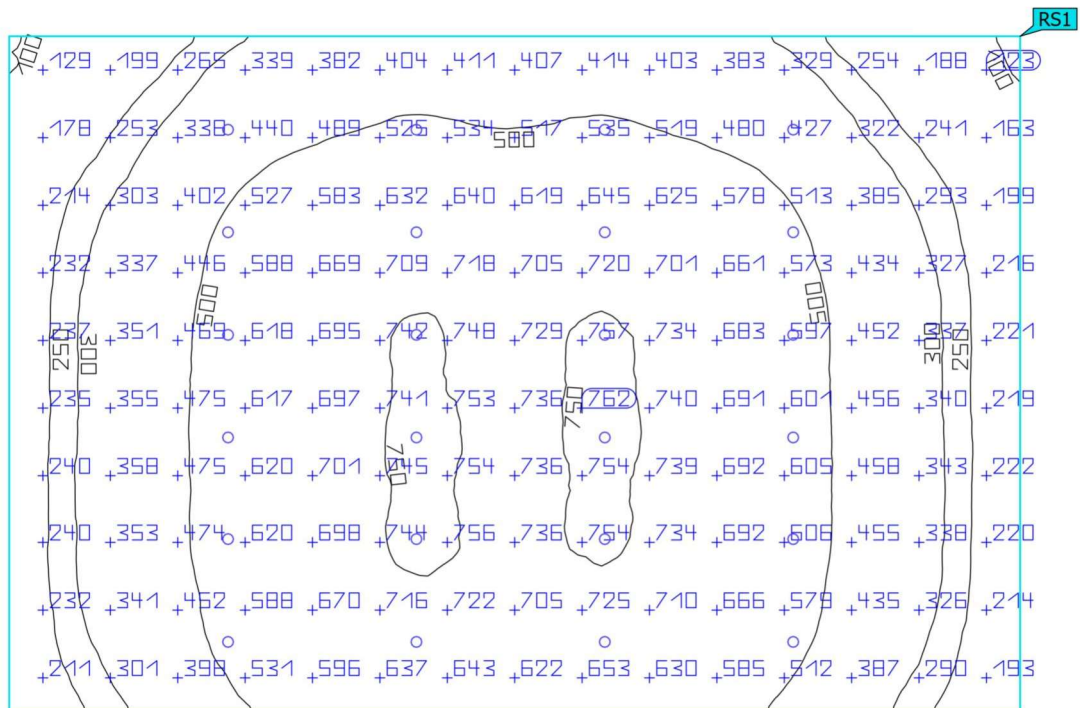


Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Room 1) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.500 m	524 lx (≥ 500 lx) ✓	92.3 lx	762 lx	0.18 (≥ 0.60) ✗	0.12	WP1

Utilisation profile: DIALux presetting (34.2 Standard (office))

Building 1 · Storey 1 · Room 1 (Light scene 1)

**Surface result object 1 (Floor/ceiling)**

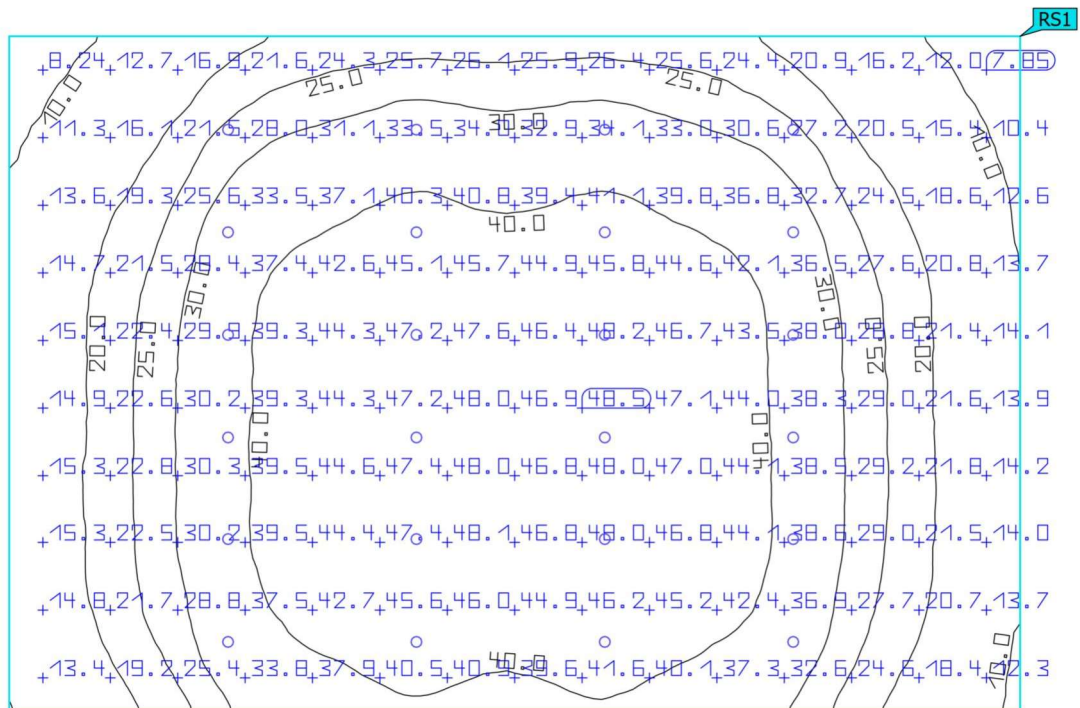


Properties	$\bar{E}$	$E_{min}$	$E_{max}$	$U_o (g_1)$	$g_2$	Index
Surface result object 1 (Floor/ceiling) Perpendicular illuminance (adaptive) Height: 0.000 m	497 lx	86.8 lx	767 lx	0.17	0.11	RS1

Utilisation profile: DIALux presetting (34.2 Standard (office))

Building 1 · Storey 1 · Room 1 (Light scene 1)

**Surface result object 1 (Floor/ceiling)**

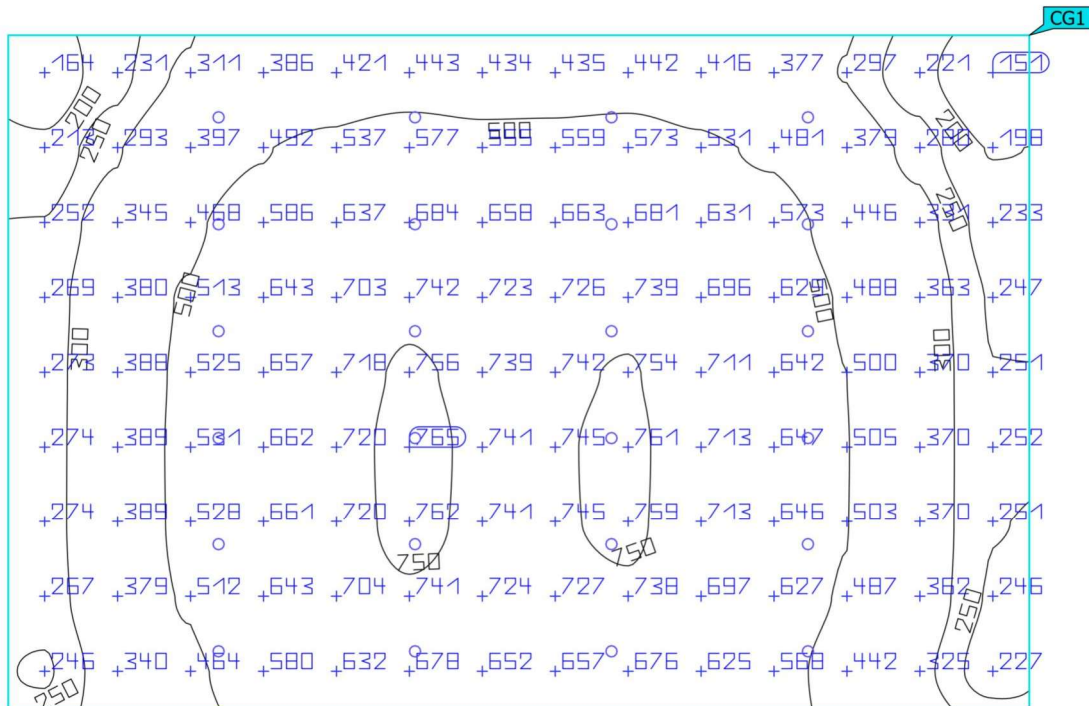


Properties	Ø	min	max	U <sub>0</sub> (g <sub>1</sub> )	g <sub>2</sub>	Index
Surface result object 1 (Floor/ceiling) Luminance Height: 0.000 m	31.6 cd/m <sup>2</sup>	5.53 cd/m <sup>2</sup>	48.8 cd/m <sup>2</sup>	0.18	0.11	RS1

Utilisation profile: DIALux presetting (34.2 Standard (office))

Building 1 · Storey 1 · Room 1 (Light scene 1)

**Calculation surface 1**



Properties	$\bar{E}$	$E_{min}$	$E_{max}$	$U_o (g_1)$	$g_2$	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	516 lx	151 lx	765 lx	0.29	0.20	CG1

Utilisation profile: DIALux presetting (34.2 Standard (office))

## Glossary

### A

A Formula symbol for a surface in the geometry

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### B

**Background area** The background area borders the direct ambient area according to DIN EN 12464-1 and reaches up to the borders of the room. In larger rooms, the background area is at least 3 m wide. It is located horizontally at floor level.

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### C

**CCT** (Engl. correlated color temperature)  
Body temperature of a thermal radiator which serves to describe its light color. Unit: Kelvin [K]. The lesser the numerical value the redder; the greater the numerical value the bluer the light colour. The color temperature of gas-discharge lamps and semi-conductors are termed "correlated color temperature" in contrast to the color temperature of thermal radiators.

Allocation of the light colors to the color temperature ranges acc. to EN 12464-1:

Light color - color temperature [K]  
warm white (ww) < 3,300 K  
neutral white (nw) ≥ 3,300 – 5,300 K  
daylight white (dw) > 5,300 K

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**Clearance height** The designation for the distance between upper edge of the floor and bottom edge of the ceiling (in the completely furnished status of room).

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**Control group** A group of luminaires that are dimmed and controlled together. For each lighting scene, a control group provides its own dimming value. All luminaires within a control group share this dimming value. The control groups with their luminaires are automatically determined by DIALux on the basis of the created light scenes and their luminaire groups.

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**CRI** (Engl. color rendering index)  
Designation for the color rendering index of a luminaire or a lamp acc. to DIN 6169: 1976 or CIE 13.3: 1995.

The general color rendering index Ra (or CRI) is a dimensionless figure that describes the quality of a white light source in regards to its similarity with the remission spectra of defined 8 test colors (see DIN 6169 or CIE 1974) to a reference light source.

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## Glossary

### D

<b>Daylight autonomy</b>	Describes what percentage of the daily working time the required illuminance is met by daylight. The nominal illuminance is used from the room profile, unlike described in EN 17037. The calculation is not done in the centre of the room but at the placed sensor measuring point. A room is considered sufficiently supplied with daylight if it achieves at least 50% daylight autonomy.
<b>Daylight factor</b>	Ratio of the illuminance achieved solely by daylight incidence at a point in the inside to the horizontal illuminance in the outer area under an unobstructed sky.  Formula symbol: D (Engl. daylight factor) Unit: %
<b>Daylight quotient effective area</b>	A calculation surface within which the daylight quotient is calculated.

### E

<b>Energy evaluation</b>	<p>Based on an hourly calculation procedure for daylight in indoor spaces, considering the project geometry and any existing daylight control systems. Orientation and location of the project are also considered. The calculation uses the specified system power of the luminaires to determine the energy demand. A linear relationship between power and luminous flux in the dimmed state is assumed for daylight-controlled luminaires. Times of use and nominal illuminance are determined from the usage profiles of the spaces. Switched-on luminaires that are explicitly excluded from control also consider the specified times-of-use. The daylight control systems use a simplified control logic that closes them at an outdoor horizontal illuminance of 27,500lx.</p> <p>The calendar year 2022 is used as a reference only. It is not a simulation of this year. The reference year is only used to assign the days of the week to the calculated results. The changeover to summer time is not considered. The reference sky type used is the average sky described in CIE 110 without direct sunlight.</p> <p>The method was developed together with the Fraunhofer Institute for Building Physics and is available for review by the Joint Working Group 1 ISO TC 274 as an extension of the previous annual regression-based method.</p>
<b>Environmental zones</b>	The assessment of intrusive light and light immission depends on the environment of the lighting installation. Depending on the standard, 4-6 different zones are defined, ranging from highly protected areas in natural settings to urban areas, commercial zones, and industrial zones.
<b>Eta (<math>\eta</math>)</b>	(light output ratio) The light output ratio describes what percentage of the luminous flux of a free radiating lamp (or LED module) is emitted by the luminaire when installed.  Unit: %

## Glossary

### G

$g_1$	Often also $U_o$ (Engl. overall uniformity) Designates the overall uniformity of the illuminance on a surface. It is the quotient from $E_{min}$ to $\bar{E}$ and is required, for instance, in standards for illumination of workstations.
$g_2$	Actually it designates the "non-uniformity" of the illuminance on a surface. It is the quotient of $E_{min}$ to $E_{max}$ and is generally only relevant for certifying the emergency lighting acc. to EN 1838.

### I

<b>Illuminance</b>	Describes the ratio of the luminous flux that strikes a certain surface to the size of this surface ( $lm/m^2 = lx$ ). The illuminance is not tied to an object surface. It can be determined anywhere in space (inside or outside). The illuminance is not a product feature because it is a recipient value. Luxometers are used for measuring.  Unit: Lux Abbreviation: lx Formula symbol: E
<b>Illuminance, adaptive</b>	For the determining of the middle adaptive illuminance on a surface, this is rastered "adaptively". In the area of large illuminance differences within the surface, the raster is subdivided finer; within lesser differences, a rougher classification is made.
<b>Illuminance, horizontal</b>	Illuminance that is calculated or measured on a horizontal (level) surface (this can be for example a table top or the floor). The horizontal illuminance is usually identified by the formula letter $E_h$ .
<b>Illuminance, perpendicular</b>	Illuminance that is calculated or measured plumb-vertical to a surface. This needs to be taken into account for tilted surfaces. If the surface is horizontal or vertical, then there is no difference between the perpendicular and the horizontal or vertical illuminance.
<b>Illuminance, vertical</b>	Illuminance that is calculated or measured on a vertical surface (this can be for example the front of some shelves). The vertical illuminance is usually identified by the formula letter $E_v$ .

### K

$k_s$	The glare effect of a light source can be described by the glare metric $k_s$ . It relates the solid angle of the glaring light source as seen from the point of immission, the ambient luminance, and the maximum allowable luminance.
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## Glossary

### L

LENI	(Engl. lighting energy numeric indicator) Lighting energy numeric indicator acc. to EN 15193  Unit: kWh/(m <sup>2</sup> * a)
LLMF	(Engl. lamp lumen maintenance factor)/acc. to CIE 97: 2005 Lamp flux maintenance factor that takes the luminous flux reduction into account of a luminaire or an LED module in the course of the operating time. The lamp flux maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no luminous flux reduction existing).
LMF	(Engl. luminaire maintenance factor)/acc. to CIE 97: 2005 Luminaire maintenance factor that takes the soiling into account of the luminaire in the course of the operating time. The luminaire maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).
LSF	(Engl. lamp survival factor)/acc. to CIE 97: 2005 Lamp survival factor that takes the total failure into account of a luminaire in the course of the operating time. The lamp survival factor is specified as a decimal digit and can have a maximum value of 1 (no failures existing within the time concerned or prompt replacement after the failure).
Luminance	Dimension for the "brightness impression" that the human eye has of a surface. The surface itself can emit light thereby or light striking it can be reflected (emitter value). It is the only photometric value that the human eye can perceive.  Unit: Candela per square metre Abbreviation: cd/m <sup>2</sup> Formula symbol: L
Luminous efficacy	Ratio of the emitted luminous flux $\Phi$ [lm] to the absorbed electrical power P [W] Unit: lm/W.  This ratio can be formed for the lamp or LED module (lamp or module light output), the lamp or module with control gear (system light output) and the complete luminaire (luminaire light output).
Luminous flux	Dimension for the total light output that is emitted from one light source in all directions. It is thus an "emitter value" that specifies the entire emitting output. The luminous flux of a light source can only be determined in a laboratory. A difference is made between the lamp or LED module luminous flux and the luminaire luminous flux.  Unit: Lumen Abbreviation: lm Formula symbol: $\Phi$

## Glossary

Luminous intensity	<p>Describes the intensity of the light in a certain direction (emitter value). The luminous intensity is a matter of the luminous flux <math>\Phi</math> that is emitted in a certain spherical angle <math>\Omega</math>. The radiation characteristics of a light source are presented graphically in a light distribution curve (LDC). The luminous intensity is an SI base unit.</p> <p>Unit: Candela Abbreviation: cd Formula symbol: I</p>
<hr/>	
M	
Maintenance factor	See MF
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MF	<p>(Engl. maintenance factor)/acc. to CIE 97: 2005 Maintenance factor as decimal number between 0 and 1 that describes the ratio of the new value of a photometric planning parameter (e.g. of the illuminance) to a maintenance value after a certain time. The maintenance factor takes into account the soiling of luminaires and rooms as well as the luminous flux reduction and the failure of light sources. The maintenance factor is taken into account either overall or determined in detail acc. to CIE 97: 2005 by the formula <math>RMF \times LMF \times LLMF \times LSF</math>.</p>
<hr/>	
O	
Obtrusive light/Light immission	<p>To protect the nocturnal environment and minimize problems for humans, flora, and fauna, it is necessary to limit obtrusive light (also known as light pollution), which can cause serious physiological and ecological issues for individuals and the environment. Light immission refers to the disturbing influence of emitted light from artificial light sources.</p>
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Operating times	<p>The assessment of obtrusive light and light immission depends on the operating times of the lighting installation. Depending on the standard, 1-3 different operating times are specified. In the absence of specific details, an operating time between 06:00 and 22:00 can be assumed.</p>
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P	
P	<p>(Engl. power) Electric power consumption</p> <p>Unit: watt Abbreviation: W</p>
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## Glossary

### R

$R_{(UG) \max}$	<p>Measure of the psychological glare in indoor spaces.</p> <p>In addition to the luminance of luminaires, the level of the <math>R_{(UG)}</math> value also depends on the observer position, the viewing direction and the ambient luminance. The calculation is made according to the table method, see CIE 117. Among other things, EN 12464-1:2021 specifies maximum permissible <math>R_{(UG)}</math>- values <math>R_{(UGL)}</math> for various indoor workplaces.</p>
$R_{DLO}$	<p>The ratio of the luminous flux emitted below the horizontal plane to the total lamp luminous flux of a luminaire or lighting installation in its operational position.</p>
$R_G$	<p>The glare directly caused by luminaires of an outdoor lighting installation is determined using the CIE Glare Rating (RG) method. To calculate this, the equivalent veiling luminance of the surroundings is needed. There are four options for determining this:</p> <ul style="list-style-type: none"> <li>• An exact calculation according to CIE 112, based on the scene area.</li> <li>• A simplified method according to EN 12464-2, based on the scene area.</li> <li>• Using a custom calculation area to determine the equivalent veiling luminance.</li> <li>• Specifying a fixed value for easy comparability.</li> </ul>
$R_{UF}$	<p>upward flux ratio</p> <p>The ratio of the luminous flux emitted directly or reflected above the horizontal plane to the luminous flux that cannot be avoided under ideal conditions to achieve the illuminance level on a deliberately illuminated area.</p>
$R_{UL}$	<p>upward light ratio</p> <p>The ratio of the luminous flux emitted above the horizontal plane to the luminous flux of a luminaire or lighting installation in its operational position. The luminaire efficiency is considered in this calculation.</p>
$R_{ULO}$	<p>upward light output ratio</p> <p>The ratio of the luminous flux emitted above the horizontal plane to the total lamp luminous flux of a luminaire or lighting installation in its operational position.</p>
Reflection factor	<p>The reflection factor of a surface describes how much of the striking light is reflected back. The reflection factor is defined by the color of the surface.</p>
RMF	<p>(Engl. room maintenance factor)/acc. to CIE 97: 2005</p> <p>Room maintenance factor that takes the soiling into account of the space encompassing surfaces in the course of the operating time. The room maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).</p>
$RUG (\max)$	<p>(unified glare rating)</p> <p>Measure for the psychological glare effect in interiors.</p> <p>In addition to luminaire luminance, the RUG value also depends on the position of the observer, the viewing direction and the ambient luminance. Among other things, EN 12464-1 specifies maximum permissible RUG values for various indoor workplaces.</p>

## Glossary

RUG observer	Calculation point in the room, for the DIALux the RUG value is determined. The location and height of the calculation point should correspond to the typical observer position (position and eye level of the user).
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S	
Surrounding area	The ambient area directly borders the area of the visual task and should be planned with a width of at least 0.5 m according to DIN EN 12464-1. It is at the same height as the area of the visual task.
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V	
Visual task area	The area that is needed for carrying out the visual task in accordance with DIN EN 12464-1. The height corresponds with the height at which the visual task is executed.
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W	
Wall zone	Circumferential area between working plane and walls which is not taken into account for the calculation.
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Working plane	Virtual measuring or calculation surface at the height of the visual task that generally follows the room geometry. The working plane may also feature a wall zone.
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